Infrared Spectroscopy of the Dwarf Starburst Galaxy Henize 2-10

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We present 1·2–2·2 μm spectra of the nucleus of Henize 2-10, taken at UKIRT with CGS 2. This galaxy displays strong line emission from interstellar H^+ (1·282 & 2·166 μm) and [Fe^+] (1·256 & 1·644 μm), in common with other star-forming galaxy nuclei. However the 1-0 S(1) line of molecular hydrogen at 2.122 μm is not detected – the upper limit of 0·15 (3σ) for the value of the flux ratio $I_{1-0S(1)}/I_{Br\gamma}$ is much lower than the typical values of 0·4–0·9 measured in a sample of 28 non-interacting starburst galaxies.

From the Paβ/Brγ line ratio we derive a total extinction of $A_V \sim 4$ mag, greater than previous estimates based on the optical line spectrum (cf. Johansson 1987; $A_V \sim 1$ mag).

The de-reddened H^+ and [Fe^+] line fluxes are used to estimate the total ionising luminosity and the average supernova rate in the central 150 pc of He 2-10. By comparison of these estimates with existing IRAS and radio continuum data we are able to set limits on the range of stellar masses present in this unevolved ($\lesssim 10^7$ yr old) starburst nucleus.

Possible reasons for the low H_2/H^+ line ratios observed in young starburst systems (He 2-10, NGC 7714, IIZw40; eg. Moorwood & Oliva 1988) are briefly discussed.

Johansson (1987) Astron. Astrophys. **182**, 179.
Moorwood & Oliva (1988) Astron. Astrophys. **203**, 278.